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EXAMINER
MURPHY, RHONDA L

ART UNIT	PAPER NUMBER
2462	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

lhptoms@leehayes.com

Office Action Summary	**Application No.**	**Applicant(s)**	
	10/686,160	RUI ET AL.	
	Examiner	**Art Unit**	
	RHONDA MURPHY	2462	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,8,10-29,32,34-50,52,54-65,67,69-80,82 and 84-92* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,8,10-29,32,34-50,52,54-65,67,69-80,82 and 84-92* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 September 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This office action is responsive to the communication filed on 6/17/09. Accordingly, claims 6, 7, 9, 30, 31, 33, 51, 53, 66, 68, 81 and 83 were previously canceled, claims 93-104 were withdrawn and claims 1-5, 8, 10-29, 32, 34-50, 52, 54-65, 67, 69-80, 82 and 84-92 are currently pending in this application.

Response to Arguments

1. Applicant's arguments, see pages 24-25, filed 6/17/09, with respect to the rejection(s) of claim 9 under 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of a newly found prior art reference.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 3 - 5, 8, 10-14, 17-25, 27-29, 32, 34-38, 41-50, 54-59, 61-65, 69-74, 77-80, 84-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gross (US 6,850,541) in view of Kerofsky (US 7,003,153) and Agrawal et al. (US 6,072,809)

Regarding claims 1, 25 and 79, Gross teaches a method, comprising: generating histogram data using packet pairs received from a data source via a network (Fig. 4; col. 2, lines 56-62), the histogram including a plurality of bins (Fig. 5; col. 3, lines 9-13), the histogram data including bandwidth samples derived from received packet pairs (col. 3, lines 10-13); spatially filtering the histogram data (col. 3, lines 53-59; further described in col. 4, lines 31-40); and estimating bandwidth available on the network using the spatially filtered histogram data (col. 3, lines 53-59; further described in col. 4, lines 57-65), and wherein the packet pairs were transmitted from the data source at a rate (packets must be transmitted at a certain rate; col. 2, lines 56-62) Claim 25 further describes a computer-readable medium having computer-executable instructions to perform the above operations (col. 5, lines 21-25).

Although Gross teaches averaging samples, Gross fails to explicitly disclose averaging samples in a first bin of the plurality of bins to form a bin average for the first bin; and filtering the bin count of the first bin as a function of the bin count of the first bin and a bin count of a second bin of the plurality of bins to form a smoothed bin count for the first bin.

However, Kerofsky teaches averaging samples in a first bin of the plurality of bins to form a bin average for the first bin (col. 7, lines 36-39, 59-62); and filtering the bin count of the first bin as a function of the bin count of the first bin and a bin count of a second bin of the plurality of bins to form a smoothed bin count for the first bin (col. 7, lines 59-62; further described in col. 8, lines 21-28).

In view of this, it would have been obvious to one skilled in the art to average samples and filter the bin count to form a smooth bin count, so as to obtain an enhanced data signal (col. 8, lines 15-18).

Gross fails to explicitly disclose wherein generating histogram data comprises aging previously generated histogram data, wherein aging previously generated histogram data comprises reducing the value a sample contributes to a bin count of a bin containing the sample, and wherein the packet pairs were transmitted from the data source at a variable rate.

However, Agrawal teaches aging previously generated histogram data (col. 3, line 63 to col. 4, line 3).

Thus, it would have been obvious to one skilled in the art to age previously generated data, in order to assess network changes based on previous data.

The combined teaching of Gross and Agrawal teach aging previously generated histogram data. Gross further teaches reducing the value a sample contributes to a bin count of a bin containing the sample (col. 4, lines 57-65).

Thus, it would have been obvious to one skilled in the art to realize aging previously generated histogram data comprises reducing the value a sample contributes to a bin count of a bin containing the sample, since the bin will already contain the previous data and therefore, reducing the sample contribution.

Regarding claims 3 and 27, Gross teaches the method of claim 1, wherein generating histogram data comprises: receiving a packet pair transmitted by the data source via the network (col. 2, lines 56-62); deriving a bandwidth sample from dispersion in the received packet pair (col. 3, lines 10-13, 34-39); and classifying the sample into a bin of the plurality of bins (col. 3, lines 9-30).

Regarding claims 4 and 28, Gross teaches the method of claim 1, wherein the plurality of bins are of uniform bin width (see Fig. 5).

Regarding claims 5, 29 and 80, Gross teaches 5 the method of claim 1, wherein the plurality of bins are organized into a hierarchical structure (see Fig. 5).

Regarding claims 8 and 32, Gross teaches the method of claim 1, wherein spatially filtering histogram data comprises providing compensation for a bin having different number of bins used in the spatial filtering on one side than its other side (col. 4, lines 31-40).

Regarding claims 10 and 34, Gross teaches the method of claim 9, further comprising filtering the bin average of the first bin using the bin average of the first bin and a bin average of the second bin (col. 4, lines 31-40, 57-65).

Regarding claims 11 and 35, Gross teaches the method of claim 9, wherein filtering the bin count of the first bin is a function of the bin count of the first bin and the bin counts of other bins of the plurality of bins, the other bins including the second bin (col. 4, lines 31-47).

Regarding claims 12 and 36, Gross teaches the method of claim 9, wherein filtering the bin count of the first bin comprises calculating a weighted average of the bin counts of the first and second bins (col. 4, lines 31-47, 57-65).

Regarding claims 13 and 37, Gross teaches the method of claim 12, wherein the first and second bins are adjacent (see Fig. 5).

Regarding claims 14 and 38, Gross teaches the method of claim 12, wherein a kernel density estimation algorithm is used to determine weights used in calculating the weighted average (col. 3, lines 53-61).

Regarding claims 17 and 41, Gross teaches the method of claim 11, wherein a kernel density estimation algorithm is used to determine the range and weights of the other bins used in filtering the bin count of the first bin (col. 3, lines 53-60; col. 4, lines 21-30).

Regarding claims 18 and 42, Gross teaches the method of claim 10, further comprising selectively spatially filtering lower level bins of a bin of the plurality of bins in response to that bin having a smoothed bin count greater than those of the other bins of the plurality of bins (col. 4, lines 48-65).

Regarding claims 19 and 43, Gross teaches the method of claim 1, wherein estimating bandwidth available on the network comprises selecting a bin average of the bin of the plurality of bins having the largest smoothed bin count (col. 4, lines 66 to col. 5, line 6).

Regarding claims 20 and 44, Gross teaches the method of claim 1, wherein estimating bandwidth available on the network comprises selecting a smoothed bin average of the bin of the plurality of bins having the largest smoothed bin count (col. 4, lines 66 to col. 5, line 6).

Regarding claims 21 and 45, Gross teaches the method of claim 19, wherein estimating bandwidth available on the network further comprises temporally filtering the selected bin average (col. 4, lines 31-47).

Regarding claims 22 and 46, Gross teaches the method of claim 20, wherein estimating bandwidth available on the network further comprises temporally filtering the selected smoothed bin average (col. 4, lines 31-47).

Regarding claims 23 and 47, Gross teaches the method of claim 21, wherein temporally filtering the selected bin average comprises calculating a weighted average of the selected bin average and a previous estimation of the bandwidth available on the network (col. 4, lines 31-56).

Regarding claims 24 and 48, Gross teaches the method of claim 22, wherein temporally filtering the selected bin average comprises calculating a weighted average of the selected smoothed bin average and a previous estimation of the bandwidth available on the network (col. 4, lines 31-56).

Regarding claims 49 and 64, Gross teaches a system (Fig. 4), comprising: a network interface (at personal computer 110) to receive data from a data source coupled to a network (col. 2, lines 56 to col. 3, lines 8); and a bandwidth estimator to estimate available bandwidth on the network (kernel level packet classifier 475; col. 3, lines 53-59), the bandwidth estimator including: a histogram generator to generate histogram data derived from packet pairs the sent by the data source and received via the network interface (col. 3, lines 1-10, 53-59), the histogram data including bandwidth samples contained in one or more bins of a plurality of bins (col. 3, lines 3-10); and a spatial filter to filter histogram data from the histogram generator (col. 3, lines 53-59; further described in col. 4, lines 57-65). Claim 64 further teaches a computer-readable medium having the above components (col. 5, lines 21-25).

Although Gross teaches averaging samples, Gross fails to explicitly disclose averaging samples in a first bin of the plurality of bins to form a bin average for the first bin; and filtering the bin count of the first bin as a function of the bin count of the first bin and a bin count of a second bin of the plurality of bins to form a smoothed bin count for the first bin.

However, Kerofsky teaches averaging samples in a first bin of the plurality of bins to form a bin average for the first bin (col. 7, lines 36-39, 59-62); and filtering the bin count of the first bin as a function of the bin count of the first bin and a bin count of a second bin of the plurality of bins to form a smoothed bin count for the first bin (col. 7, lines 59-62; further described in col. 8, lines 21-28).

In view of this, it would have been obvious to one skilled in the art to average samples and filter the bin count to form a smooth bin count, so as to obtain an enhanced data signal (col. 8, lines 15-18).

Gross fails to explicitly disclose aging the histogram data when a packet pair is received.

However, Agrawal teaches aging histogram data (col. 3, line 63 to col. 4, line 3).

Thus, it would have been obvious to one skilled in the art to age data, in order to assess network changes based on previous data.

Regarding claims 50 and 65, Gross teaches the system of claim 49, wherein the histogram data has a hierarchical structure (see Fig. 5).

Regarding claims 54, 69 and 85, Gross teaches the system of claim 53, wherein the bandwidth estimator is to estimate the available bandwidth on the network as a function of the smoothed bin count and bin average of the bin having the largest smoothed bin count, wherein a bin's bin average is an average value of all samples contained in that bin (col. 4, lines 66 to col. 5, line 6).

Regarding claims 55 and 70, Gross teaches the system of claim 53, wherein the spatial filter is further to calculate a smoothed bin average using a weighted average of a selected bin's bin average and the other bin's bin average, wherein a bin's bin average is an average value of all samples contained in that bin (col. 4, lines 66 to col. 5, line 6).

Regarding claims 56, 71, 84 and 86, Gross teaches the system of claim 55, wherein the bandwidth estimator estimates the available bandwidth on the network as a function of the smoothed bin count and the smoothed bin average of the bin having the largest smoothed bin count, wherein a bin's bin average is an average value of all samples contained in that bin (col. 4, lines 66 to col. 5, line 6).

Regarding claims 57, 72 and 87, Gross teaches the system of claim 55, wherein the selected bin and the other bin are adjacent bins (see Fig. 5).

Regarding claims 58, 73 and 88, Gross teaches the system of claim 57, wherein the spatial filter is further to calculate a smoothed bin average using a weighted average of a selected bin's bin average, the other bin's bin average and a compensation factor when the selected bin has only one adjacent bin, wherein a bin's bin average is an average value of all samples contained in that bin (col. 4, lines 31-47; 57-65).

Regarding claims 59, 74 and 89, Gross teaches the system of claim 55, wherein the weights used in the weighted average are determined using a kernel density algorithm (col. 3, lines 53-61).

Regarding claims 62, 77 and 90, Gross teaches the system of claim 59, wherein the bandwidth estimator further comprises a temporal filter (col. 4, lines 31-47).

Regarding claims 63, 78 and 91, Gross teaches the system of claim 62, wherein the temporal filter is to calculate a weighted average of a selected smoothed bin average and a previous estimation of the bandwidth available on the network, the smoothed bin average being calculated using a weighted average of the selected bin's bin average and another bin's bin average, wherein a bin's bin average is an average value of all samples contained in that bin (col. 4, lines 31-47).

Regarding claim 92, Gross teaches a computer-readable medium having components as recited in claim 79 (col. 5, lines 21-25).

1. Claims 2, 26, 52, 67 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gross, Kerofsky and Agrawal as applied to claims 1 and 25 above, and further in view of Loguinov et al. (US 2002/0169880 A1).

Regarding claims 2 and 26, Gross teaches the method of claim 1, wherein the packet pairs are interspersed in a data stream (col. 2, lines 56-65).

Gross fails to explicitly teach a real-time data stream.

However, Loguinov teaches packet pairs interspersed in a data stream (page 2, paragraph 21).

Therefore, it would have been obvious to one skilled in the art to include a real-time data stream, as taught by Logion, in order to transmit data packets at the time in which they occur. 52.

Regarding claims 52, 67 and 82, Gross teaches the system of claim 49, but fails to explicitly teach wherein the packet pairs conform to a Real-time Transport Control Protocol (RTCP) and are interspersed in a data stream conforming to a Real-time Transport Protocol (RTP).

However, Loguinov teaches RTCP and RTP (page 2, paragraph 21).

Thus, it would have been obvious to one skilled in the art to include RTCP and RTP, for the purpose of transmitting data packets occurring to a real-time protocol.

2. Claims 15, 16, 39, 40, 60, 75 and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gross, Kerofsky and Agrawal as applied to claims 14 and 38 above, and further in view of Burchfiel (US 2004/0092281 A1).

Regarding claims 15, 39, 60 and 75, Gross teaches the method of claim 14, including a kernel density estimation algorithm.

Gross fails to explicitly disclose the kernel density estimation algorithm using a linear kernel.

However, Burchfiel teaches the kernel density estimation algorithm using a linear kernel (Fig. 7, page 9, paragraph 114).

Thus, it would have been obvious to one skilled in the art to include a linear kernel, for the purpose of representing the data in a linear fashion.

Regarding claims 16, 40, 61 and 76, Gross teaches the method of claim 14, including a kernel density estimation algorithm.

Gross fails to explicitly disclose the kernel density estimation algorithm including a Gaussian kernel algorithm.

However, Burchfiel teaches the kernel density estimation algorithm including a Gaussian kernel algorithm (page 8, paragraph 98 and 100).

Thus, it would have been obvious to one skilled in the art to include a Gaussian kernel algorithm, for the purpose of representing data using rise and fall times.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RHONDA MURPHY whose telephone number is (571)272-3185. The examiner can normally be reached on Monday - Friday 9:00 - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Rhonda Murphy
Examiner
Art Unit 2462

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